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MAJOR CROP PROGRESS AND WEATHER REPORTING

CROP TENDING MEASURES IN ROSTOVSKAYA OBLAST DISCUSSED

Moscow IZVESTIYA in Russian 6 Jun 80 p 1

[Article by G. Gubanov (Rostov-na-Donu): "Summer in the Don River Region"]

[Text] With each passing day the grain fields in the Don River region are becoming more rich looking in appearance. Strong shoots are appearing on the winter crops and fine ears are forming. The oblast's machine operators have just completed sowing their rice and applying the first top dressing to the winter crops.

"In tending the winter crops" stated the chief agronomist for the Gigant Sovkhoz N. Trofimenko, "during a given stage in the campaign to obtain high yields of grain and, even more important, to obtain strong and valuable wheats, importance is attached to having an accurate knowledge of those fields which in all probability will produce excellent grain. A laboratory determines the presence of nutrients in the leaf portion of a plant and if the content is less than the potential norm, then we do not apply fertilizer to the field. In this manner, we conserve in the use of resources. On the other hand, we apply top dressings to those crops where a good foundation has been established for strong grain."

It bears mentioning that it is to the credit of the Don region farmers that the method of laboratory analysis and forecasting of strong wheat production is already being employed extensively on almost all farms. And this is quite understandable. Indeed the principal goal -- that of carrying out the obligations with regard to the production of grain -- requires a constant searching for reserves and maximum output of energy and knowledge by both the scientists and machine operators.

For example, let us take our rye plantings, which occupy an area in excess of 1 million hectares throughout the oblast. In the opinion of Doctor of Agricultural Sciences A. Sokol at the Don Plant Breeding Center, the situation on these fields is more complicated. If at the present time we were able to provide the barley with just 1 quintal of nitrogen fertilizer per hectare then, based upon the development of the plantings, each hectare

would furnish up to 3 additional quintals of grain. Requisitions were long ago submitted for 150,000 tons of such fertilizer and the grain growers are wasting valuable time in anticipation of it being received. Meanwhile, nothing is available for easing the hunger for nitrogen out on the fields.

Many problems are also arising during the early part of this summer out on the corn and vegetable plantations and also on the sunflower, sorghum and beet fields.

Pre-seedling "blind" harrowing, an agricultural method that has undergone testing over a period of many years, has already been carried out on the entire area of row crops. Fine seedlings have appeared on four out of every five hectares and more than two thirds of the fields have been harrowed.

The kolkhozes and sovkhozes in the Don region are following a course aimed at sharply expanding the cultivation of corn using an industrial technology and they have increased their corn growing areas by a factor of 15 compared to last year. Nevertheless, we still have not eliminated entirely the use of manual weed control operations on the plantations. On large worker settlements and in villages, based upon initiative displayed by the local soviets of worker's deputies, mass meetings of the population were held, where unanimous decisions were handed down calling for the thorough tending of each hundredth of a hectare and each row of crops. Many residents have displayed initiative by volunteering to tend no less than 1 hectare of crops.

Thousands of city workers in the Don region are going out to the kolkhozes and sovkhozes at the present time in order to assist the farmers in clearing the fields and plantations of weeds and raising the density of the plant stands to the norm figure.

"Earlier we assigned the crops to farmyards, enterprises and organizations" stated the 1st secretary of the Veshenskiy Rayon Party Committee N. Bulavin, "But here is what happened: the helpers came to the farms and at best they were commanded by an agronomist; he would point out the field and they would work. On another occasion they were sent out to eliminate weeds among the vegetable crops and still on a third occasion -- no work was provided for them. It was clearly a case of absence of personal responsibility."

This year we reorganized the labor organization for the city-dwellers. Agreements calling for collaboration between the enterprises, organizations and farms have now been concluded. These agreements indicate the particular areas to be worked and the amount of crops to be cultivated by the helpers, for example fodder beets or another crop, and the farms for their part are obligated to issue appropriate payments. Thus, as the saying goes, each collective has its own field, sees the results of its labor and is interested in achieving high indicators.

It is hoped that the experience of the workers in Veshenskiy Rayon will be actively supported in other rayons, thus precluding the need for a mass exodus of people from the cities.

"Assistance should be furnished to those who are performing in a diligent manner" state the patrons. And truly, today the principal burden with regard to tending the crops is being borne by the kolkhoz and sovkhoz machine operators. Indeed, there was ample reason for 350 teams promising to obtain 22-26 and 560 teams -- 16-20 quintals of sunflower seed from each hectare. Even higher goals are planned by the corn growers. One hundred and sixty teams resolved to obtain 60-100 or more quintals under irrigation conditions and 200 collectives vowed to obtain 50 quintals of grain per hectare under non-irrigation conditions.

One million tons of grain will be obtained from the corn, rice, millet and sorghum crops. The millet crop is deserving of special mention. In view of the weather conditions, the plantings of this crop were increased to 130,000 hectares -- 9,000 more than the figure called for in the plan. This represents one source for the production of additional grain. It should be noted that this year the farms in the Don region not only intend to fulfill their tense grain production plans, but in addition they plan on maintaining the conditions required for the harvesting of each crop. "We are aware" state the farmers, "that the country requires not just grain, but grain of high quality and in the required assortment: to include wheat, peas, soybeans and buckwheat."

At the Kolkhoz imeni Grechko in Kuybyshevskiy Rayon, the initial units move out onto the plowed land at 0400 hours in the morning. At 1400 hours in the afternoon the second shift appears and continues the work until the evening dew falls. In Zernogradskiy Rayon the machine operators also go out onto the plantations at an early hour, but here they work in the same manner as when harvesting the grain crops: 2-3 hours behind a steering wheel before they are replaced and allowed to rest. This method ensures both high labor productivity and high quality work.

Many examples could be cited highlighting the skilful organization of work in Aksayskiy, Tarasovskiy, Sal'skiy, Zernogradskiy, Neklinovskiy, Matveyev-Kurganskiy, Bagayevskiy and other rayons.

At the present time, with a high value being placed on each moment of time and with all effort being subordinated to one goal -- tending the crops in the proper manner -- slow and sluggish operations are being tolerated in various areas. In Kasharskiy, Morozovskiy, Oblivskiy, Chertkovskiy and Belokalitvinskiy rayons the cultivators are by no means being operated throughout the entire daylight period, nor has efficient technical servicing been organized for them. As a result, following breakdowns they at times remain idle for prolonged periods of time. It is in this area that very strict requirements must be imposed upon the engineering services of the farms. Their primary responsibility is to ensure continuous and efficient

operation of the equipment throughout the entire daylight period and to achieve a situation wherein a master trouble-shooter and mobile workshops are available out on the fields on which the machine operators are working. On the eve of the working day, each machine operator must obtain a clear understanding of the task, the technical principles involved in working the fields and the output norms. The brigade and department leaders and the farm specialists must assist them in this regard.

The ears of wheat are forming out on the Don region expanses and the corn and sunflowers are stretching out to catch the light. And each day these boundless fields await and require the attention of concerned hands, so that the farmers will be amply awarded for their labor during the hot harvest season.

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CSO: 1824

MAJOR CROP PROGRESS AND WEATHER REPORTING

PEST, DISEASE FORECAST FOR BELORUSSIAN SSR

Minsk SEL'SKAYA GAZETA in Russian 1 Jun 80 p 2

[Article by P. Yas'kova, head of Belorussian Republic Laboratory for Forecasts and Diagnostics for Plant Pests and Diseases and N. Kharchenko, head of Laboratory for Forecasts of BelNIIZR: "Forecast of Development of Agricultural Crop Pests and Diseases for First Decade of June This Year"]

[Text] Following the winter period, the number of agricultural crop pests in the republic continues to be considerable. The cold and delayed spring only served to restrain temporarily their development and harmful activity. Their activity has increased with the onset of warm weather.

Flax flea-beetles are causing damage to the flax plantings in all areas. Their number exceeds 30 per square meter and thus it is economically advisable to commence chemical treatment against them. In view of the fact that they cause more damage during hot and dry weather, the chemical treatment of the flax seedlings should commence immediately.

Flea-beetles and opaque carrion beetles have appeared out on the beet plantings. Special attention should be given to organizing a campaign against the opaque carrion beetles in Ivatsevichskiy, Pinskiy, Luninetskiy, Grodnenskiy, Gomel'skiy, Kalinkovichskiy, Lyubanskiy and Klimovichskiy rayons, where there is a greater danger of plant damage occurring in plantings located in the vicinity of areas in which this pest was concentrated last year. Chemical treatment must be carried out when the number of pests per square meter reaches two for the opaque carrion beetle and 10 for the garden fleas.

On farms in Gomel'skaya Oblast, where core rot is observed each year in the beet root crops, caused by a boron deficiency in the soil, a top dressing of boron should be applied to the plant seedlings during the phase of two true leaves.

An analysis of the frit-fly populations in all areas reveals that their intensive flight can be expected in early July. At this time the mass plantings of spring grain crops will be in a less vulnerable phase of

development -- tillering. The flies may cause considerable damage to late plantings of spring grain crops located in the vicinity of August-sown winter crops. If the number of flies in barley is more than 25 and in oats more than 30 per 100 sweeps of an insect net, chemical weed control work in such plantings should ideally be carried out with insecticides added.

Mustard family fleas cause damage to cabbage out on the fields and in nurseries and to turnips, rape and other crops of the mustard family. The number of these pests and the harm caused by them will be high during warm and dry weather. Chemical treatment should be carried out when there are more than three of these pests per plant.

Sucking and leaf-chewing pests continue to cause damage to orchards in all areas, with the young leaves of apple and pear trees becoming infested with scab and other leaf blights. The phase during which the buds separate and turn pink in color is considered to be the best period in which to combat a complex of pests and diseases. In addition to chemical preparations and when the temperature exceeds 13 degrees, use can be made of the bio-preparations dendrobacillin, BIP or bitoxbacillin.

In order to prevent the appearance of white leaf blight and macrosporiosis on tomato plants in the field, the seedlings should be treated with fungicides 5-6 days prior to planting.

Each year, considerable damage is caused to cucumber sprouts by Chortophila florilega. In order to prevent the germinating seed and seedlings from perishing, the farmyard manure which attracts the flies should be thoroughly plowed under. The seed must be dusted using phenteturam -- 3 grams, or TMTD [tetramethylthiuram disulfide] -- 4 grams per kilogram of seed.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

MEASURES FOR COMBATING PESTS, DISEASES OF AGRICULTURAL CROPS

Kishinev SOVETSKAYA MOLDAVIYA in Russian 15 Apr 80 p 3

[Article by Main Administration for the Protection of Plants of Moldsel'-khozkhimiya: "How To Destroy Pests"]

[Text] This year has turned out to be an extremely favorable one for the principal pests and diseases of agricultural crops. The prolonged autumn and moderate winter promoted good wintering of the pests in the soil. The increase in temperatures during the month of April brought about their rapid rise to the surface. This is making it possible, using one effective method, to destroy a considerable number of the pests without having to carry out repeated treatments.

The appearance of a majority of the harmful insects will coincide with the seedling stage for cultivated crops, that is, with the most vulnerable phase of their development. Under such conditions, even the slightest delay in the carrying out of chemical treatment work could result in mass damage and raise the need for resowing a particular crop. Thus the fields must be inspected on a daily basis and measures must be undertaken to protect the plants. The possibility is not ruled out that several types of insects may appear simultaneously in the plantings of winter wheat, barley, sunflowers, sugar beets, corn and other crops. This could result in a great amount of damage to the crops.

According to the forecast, the winter crop plantings are threatened seriously this year by the grain ground beetle, grass flies and the southern grey weevil. The timely treatment of fields using the hexachloran and metaphos preparations will produce good results in combating these pests. In combating the southern grey weevil, emphasis should be placed on treating border strips, particularly those areas which border on corn and sunflower plantings.

With the onset of daily plus temperatures that are no lower than 18 degrees, chemical weed control work using 2.4-D (amine) salt should be carried out prior to the shooting stage for the winter crops, on thinned out tracts that

are not subject to resowing. Seed plantings of winter wheat, when threatened by strong powdery mildew and septoria spot development, should be sprayed with fundazol or sulphur preparation and against septoria spot -- sineb.

For protecting the seed of row crops against damage caused by wireworms, toxication of the seed should be carried out immediately using a gamma-isomer of hexachloran or heptachlor with phosphamide. In those areas where the seed is not to be treated, granulated preparations should be applied to the soil simultaneously with the sowing work.

The bulk of the beet weevils -- up to 95 percent -- is found on old beet tracts. In order to prevent them from shifting over to new sugar beet plantings, the border strips of the old beet tracts should be chemically treated when the pests first make their appearance. Upon the appearance of leaf beetles, flea beetles and weevils on the seedlings, the beets should be treated using such preparations as hexachloran, pthalophos, bazudin or polychlorcamphene.

It is recommended that chlorophos or metaphos be used for protecting pulse crop seedlings against sitona weevils. First of all, the edges of fields should be treated to a depth of 30-40 meters from perennial grass tracts and forest belts. These treatments are also effective against other types of weevils.

In order to protect sunflowers from damage caused by the southern grey and beet weevils, the plantings should be treated using hexachloran or metaphos preparations.

Taking into account the possibility that the pests may appear simultaneously and in mass numbers over large areas and also the fact that the machine-tractor pool may be operating under a severe workload during the period of early spring operations, extensive use should be made of aviation. Success can be achieved in protecting crops against pests and diseases only upon the condition that complete and operational use is made of all available resources.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

FIELD WORK SITUATION IN NONCHERNOZEM ZONE

Moscow SOVETSKAYA ROSSIYA in Russian 24 May 80 p 1

[Article by Ye. Kardash, chief of the Main Administration of the Central Region, RSFSR Ministry of Agriculture; G. Gulyayev, director of the Scientific Research Institute of Agriculture for the Central Regions of the Nonchernozem Zone: "Value Every Hour"]

[Text] This year field work in the Nonchernozem Zone is being done under difficult conditions imposed by a late and cold spring. Because of low temperatures and water-logged soils, early spring crops have still not come up over large areas and in some oblasts--particularly, Ivanovskaya, Rostovskaya and Yaroslavskaya--sowing has not even been completed. Normal ripening of grain in this zone requires positive temperatures equal to 1,600 degrees for barley and 1,800 degrees for oats. The plan for sowing of spring crops must be completed on all farms within the next few days. Every hour is to be valued.

With the late sowing it is essential that diligent watch be kept over the quality of all work; short-cuts cannot be allowed. Since soils are highly compacted, sowing must be done only in well-cultivated soil with no delay between cultivation and sowing. To accelerate seedling emergence, the seed must be sown at a shallower depth than usual. Late sowings have less energy for reaching the tillering stage. Therefore, the sowing rate should be increased by 10-15 percent. This will substantially increase the yield.

In the regions north of Moscow conditions for care and development of winter crops were less favorable; they are broken down and grown up in weeds. In order to prevent growth of weeds and increase yields, when warm days arrive these fields must be treated with herbicides (amine salt 2,4-D at a rate of .6 kilogram of active agent per hectare).

The spring grain crops may also be grown up in weeds due to their late emergence. These fields should first be treated with amine salt 2,4-D. The use of harrows to combat weeds in heavy loam soils is not desirable.

Weather is now favorable for the formation of winter crops and perennial grasses. The condition of sowings which have grown sparse through the winter is now improving. In order not to allow these crops to become beaten down, they should be treated with retardants: winter rye with kampozan-4 liters per hectare in the middle of the stem-extension stage; winter wheat with TUR-6-8 liters per hectare at the beginning of the same stage. The time for this treatment is practically upon us.

This year we can expect a long interval between maturation times for winter and spring grain crops. This will allow better organization of the harvests.

Below-normal temperatures and an abundance of moisture in May are favorable for tillering and putting on of green growth by perennial grasses. Under these conditions, in order to bring the fodder yield up to 350-400 quintals per hectare and increase its protein content to 10-15 percent, it is advisable to apply supplementary nitrogen fertilizer.

It is not too late to recommend that broken down first-year grass stands having fewer than 50 plants per square meter be over-sown with any of the perennial grasses mixed with barley or oats.

Old broken-down grass stands that are plowed this year should be cut early and resown in annual grasses to increase the yield of green chop.

As we complete sowing and undertake the care of crops, it is necessary to take all measures to improve the condition of fields: close up gaps; level the edges of fields; systematically destroy weeds in the sowings, in the passage strips and along roadways.

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MAJOR CROP PROGRESS AND WEATHER REPORTING

BRIEFS

UZBEKISTAN GRAIN HARVEST REPORT--The harvesting of grain crops is in full swing in Uzbekistan. It is already nearing completion in the southern part of the republic and many farms in Surkhandar'inskaya Oblast have fulfilled or over-fulfilled their state plans. Angorskiy, Termezkiy and Dzharkurganskiy rayons were the first here to complete their grain harvest work. The harvesting of grain crops is also in full swing in Kashkadar'inskaya, Andizhanskaya, Ferganskaya and Tashkentskaya oblasts. The republic's grain growers are devoting a great amount of effort towards ensuring that the grain of the new harvest is gathered up quickly and without losses. [Text] [Moscow IZVESTIYA in Russian 7 Jun 80 p 1] 7026

TURKMEN GRAIN HARVEST OPERATIONS--Turkmen SSR--The harvesting of grain crops has commenced in the republic. The machine operators in Ashkhabadskaya Oblast were the first to begin this work. The workers at the Kolkhoz imeni Lenin in Geok-Tepinskiy Rayon are harvesting their barley crop in an efficient manner, while making extensive use of the method employed by the Ipatovo farmers. The initial tons of barley grain have been received at the Ashkhabad Grain Products Combine. [Text] [Moscow IZVESTIYA in Russian 5 Jun 80 p 1] 7026

GRAIN SOWING WORK COMPLETED--The republic's farmers have completed sowing their grain and pulse crops several days earlier than was the case last year. These crops have been planted on an area in excess of 23 million hectares. Despite the fact that a considerable portion of the land was not prepared in the autumn owing to unfavorable weather, the sowing work was carried out during the best periods and in a high quality manner. This was the result of the work being organized based upon the large group method: more than 3,000 mechanized complexes were in operation. This made it possible on some days to sow 1.5-1.7 million hectares -- an unprecedented indicator. The principal food crop -- wheat -- was sown on 15.7 million hectares. Only seed for strong and valuable varieties of the highest condition was planted in the soil. Phosphorous fertilizers were applied to the rows over large areas. Only anti-erosion sowing machines were used. In all areas the sowing work was carried out more rapidly than ever before. The leading machine operators fulfilled one and a half to two norms during just one shift, sowing 110-150 hectares with their Kirovets machines. As

a rule, the equipment was employed in two shifts. This was achieved by virtue of having trained a large number of machine operators during the winter period. Many farms completed their sowing work in just 5-7 working days. The republic's farmers introduced substantial changes into the disposition of the sown areas. The plan for the sowing of wheat was over-fulfilled and, owing to the introduction into operations of new irrigated lands, the sugar beet, rice and cotton plantations were expanded. The buckwheat, peas and soybean sowings were increased. The sowing work was carried out under the slogan: "A Badge of Quality for Each Field" and "For the Last Year of the Five-Year Plan -- Full-Weight Ears of the Virgin Land!" Healthy seedlings have appeared out on the fields. The machine operators have commenced tending their crops. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 31 May 80 p 1] 7026

FIELD WORK IN TURKMEN SSR--Ashkhabad, 13 May--The farmers in the Turkmen SSR sowed their spring crops during the best periods: cotton, corn, alfalfa and early vegetables. Healthy seedlings have appeared in all areas and at the present time all effort on the farms is being directed towards creating optimum conditions for the optimum development of the plants. The workers in Chardzhouskaya, Maryyskaya and Ashkhabadskaya oblasts are loosening the inter-row spacings and thinning out the plants on the cotton and corn plantations and they are also harrowing and repairing the alfalfa tracts. The first watering has been carried out on 100,000 hectares of spring crops. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 14 May 80 p 3] 7026

MASS HARVESTING OF WINTER GRAINS--Ashkhabad, 6 June--The grain growers of the Prikopetdagskaya Valley and the Tedzhen Oasis -- the principal grain areas of the Turkmen SSR -- have commenced their mass harvesting of winter grain crops. Eighty two harvesting-transport complexes, numbering approximately 400 combines, hundreds of tractor trains, motor vehicles and other transport equipment, have been created. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 7 Jun 80 p 1] 7026

TSELINEGRADSKAYA OBLAST GRAIN PLAN--Tselinograd--Yesterday the farmers in Tselinogradskaya Oblast completed their sowing of grain crops considerably earlier than usual. Mineral fertilizers were applied to almost 1 million hectares of fields simultaneously with the seed. This year the virgin land grain growers plan on selling 2.5 million tons of grain to the state. [Text] [Moscow TRUD in Russian 30 May 80 p 1] 7026

GRAIN HARVEST IN TURKMEN SSR --Ashkhabad--Motor vehicle trains are transporting the grain of the new harvest over the roads in the southern part of Turkmenistan. Yesterday the first 1,000 tons of barley were delivered to procurement points in Ashkhabadskaya and Maryyskaya oblasts. Those kolkhozes in Ashkhabadskiy and Gyaurskiy rayons which cultivate grain on virgin land in the zone of the Kara-Kum Canal obtained 30-35 quintals of grain from each hectare. This year, those farms in the republic which specialize in cotton and vegetable production set aside 86,000 hectares for grain crops. The plans call for no less than 20 quintals of grain to be obtained from each hectare. [Text] [Moscow TRUD in Russian 6 Jun 80 p 1] 7026

GRAIN PRODUCTION INCREASE PLANNED--Ternoz--Dozens of tons of wheat grown on irrigated land have been delivered to the grain receiving enterprises by farms in Shurchinskiy and Gagarinskiy rayons of Surkhandar'inskaya Oblast. This year the farmers plan to increase their grain production considerably. All of the procurement enterprises have been made ready for accepting and storing it. This year, for the very first time, the grain will be shipped to a milling combine that has been erected in the rayon center of Shurchi. Its first phase, which has already been placed in operation, includes an elevator for 114,000 tons and a mill for the processing of 600 tons of grain daily. [Text] [Moscow TRUD in Russian 6 Jun 80 p 1] 7026

KAZAKHSTAN FIELD WORK--Alma-Ata, 26 May--The kolkhozes and sovkhozes of Kazakhstan completed their sowing of the principal food crop -- spring wheat -- during the best periods. It was sown on an area in excess of 15 million hectares. The successful carrying out of the sowing work was promoted by fine preparation of the equipment and seed, well thought out organization of all field work and by extensive use of the experience accumulated by the Ipatovo farmers. The daily increase in the area sown in grain crops has reached 1.4 million hectares. In particular, the work is being carried out at a high tempo in the virgin land oblasts. During a period of 24 hours, the machine operators in Kustanayskaya Oblast sowed 322,000 hectares, Tselinogradskaya Oblast -- 220,000 and in Turgayskaya Oblast -- 207,000 hectares. The republic's farms are continuing to sow forage and pulse crops. The center of the work has shifted to haying lands where the mass procurement of coarse feed for animal husbandry has unfolded. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 27 May 80 p 1] 7026

DIFFICULT SOWING CONDITIONS--Permskaya Oblast--The grain growers in the western Urals region are encountering difficult conditions in carrying out their sowing work this year. First of all, the delayed spring caused a postponement in the work schedules and, secondly, roughly one third of the spring fields -- 420,000 hectares -- had to be sown following spring plowing. But even under these conditions, many collectives succeeded in making up for the lost time. The leading rayons include Chaykovskiy, Bardymskiy and Ordinskiy, where the sowing machines are already departing the fields. For the oblast as a whole, the daily increase in the sown areas has reached 75,000-80,000 hectares. For the most part, this was made possible owing to the extensive organization of field work based upon the Ipatovo method. Five hundred and sixty mechanized complexes are carrying out the soil preparation and sowing work on the farms. True, they are not operating in an efficient and productive manner in all areas; in some areas

they have been unable to ensure around-the-clock operation of the equipment. This fact alone, for example, explains why such rayons as Il'inskiy, Solikamskiy, Karagayskiy and Sivinskij have fallen behind in carrying out this work. Lack of organization and sluggish activities out on the fields are especially intolerable at the present time, since the time is at hand for the mass planting of potatoes and vegetables and for the sowing of late forage crops. [Excerpts] [Moscow SEL'SKAYA ZHIZN' in Russian 27 May 80 p 1] 7026

SPRING SOWING OPERATIONS COMPLETED--Orenburg, 27 May--The grain growers in Orenburgskaya Oblast -- the largest grain area in Russia -- have completed sowing their spring crops, with the work having been carried out during the best periods and in a high quality manner. Good quality seed has been planted in the soil on an area of 4.4 million hectares. Healthy seedlings have made their appearance in the southern rayons of the oblast. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 28 May 80 p 1] 7026

ANTI-LODGING KAMPOZAN PREPARATION--Grodno, 26 May--This year the farmers at the Kolkhoz imeni Lenin in Smorganskiy Rayon vowed to obtain no less than 30 quintals of grain from each hectare of rice planting. In order to obtain such a yield, the crop was planted in well cultivated and fertilized soil. The crop endured the winter in fine condition. In order to avoid lodging, the plans called for the plantings to be treated with a special preparation. Kampozan was employed for the very first time for this purpose. The machine operators commenced this work just as soon as the plants entered the shooting stage. They applied the preparation to the plantings on a warm sunny day. This year, at kolkhozes and sovkhozes throughout the rayon, kampozan will be employed to combat lodging in rice plantings on 850 hectares. This work is being carried out using the resources of both the farms and the collective of the rayon office for agricultural chemistry. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 27 May 80 p 1] 7026

PROGRESSIVE CULTIVATION TECHNOLOGY--Orel--A progressive technology for the cultivation of buckwheat is being introduced into operations on farms in Orlovskaya Oblast. The mass sowing of this crop is being carried out using the wide-swath method. This will make it possible to carry out several inter-row cultivations of the plantings with simultaneous applications of fertilizer. [Text] [Moscow TRUD in Russian 30 May 80 p 1] 7026

FOR HIGH FORAGE CROP YIELDS--Khar'kov--Irrigated lands are included in the crop rotation plan for farms located on the flood-plain of the Velikiy Buriuk River. The irrigation system, created here on an area of 3,000 hectares, serves to guarantee that high forage crop yields will be obtained. [Text] [Moscow TRUD in Russian 30 May 80 p 1] 7026

MECHANIZED DETACHMENTS FORMED--Kiev--This year the Ukrainian grain will be harvested only by complex mechanized detachments. The formation of these detachments was completed yesterday on farms throughout the republic. Each of these subunits, created based upon the Ipatovo method, has crews for double-shift operations. This will make it possible to maintain a high work tempo for the cutting and thrashing of the grain crops, which occupy an area of more than 17 million hectares at the kolkhozes and sovkhozes. [Text] [Moscow TRUD in Russian 6 Jun 80 p 1] 7026

POST HARVEST CROP PROCESSING

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MORE ATTENTION TO EFFICIENT CROP TRANSPORT URGED

Moscow MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PRIMYSHLENNOST' in Russian No 5, May 80 pp 19-21

[Article by V. Martynov, assistant director of the Transport Administration of the USSR Ministry of Procurement: "More Attention to Unit-Train Routing of Grain Shipments"]

[Text] A permanent, comprehensive development program for transport must be worked out which would absorb the best achievements of scientific and technical thought. This program is called upon to cover the questions of the development and linking of all types of transport. It should be focused on modernizing the railroads...[and] on mechanizing handling operations. Particular attention should be given to radical improvement of the organization of shipments and more rational planning of them.

L. I. Brezhnev
from speech at the November (1979)
CPSU Central Committee Plenum

Increasing the effective use of material, labor and financial resources is one of the most important tasks at all stages of communist construction. A major role in solving this task of enormous importance belongs to transport, which satisfies the national economy's requirements for shipment of different freights, including agricultural products. This is particularly true of railroad transport, which accounts for more than 75 percent of domestic freight turnover. Shipments of grain freights represent a large volume of this freight turnover.

With an increase in grain production, requirements for grain shipments increase in order to provide the country's industry with raw materials, the population with bread and public animal husbandry with feeds. In the last eight years alone the volume of shipments of grain freights

increased by 127 percent, including shipments of grain (by 135 percent) and mixed feeds (by 183 percent).

During mass reception of grain, the volume of shipments (handling) of it is 5-7 percent of the total volume of all freights in the country and is as high as 25 percent for the Tselinnyy, Yuzhno-Ural'sk, Privolzhsk and Odessa Railroads.

In order for the increasing volumes of grain shipments to be dealt with effectively, the use of railroad rolling stock must be improved, and excessive transportation costs must be eliminated.

One of the effective modes of increasing the utilization of railroad rolling stock is routing shipments of grain freights in unit trains and mechanizing handling operations.

The unit train runs to the station of destination without reforming at railroad junctions en route. This makes it possible to shorten the time of grain transportation and reduce transportation costs. Specialized unit train stock more fully satisfies the demand for cars.

Two methods of forming and organizing volumes of car traffic are being used in railroad transport at present. These are, first, formation of unit trains at classification yards and, second, at the loading points of the cars. The second method is planned and organized at the grain-receiving enterprises. This method is called routing in unit trains from the loading sites.

Unit trains from the loading sites are classified according to their method of organization and formation as consigner trains and multistage trains and according to their destination--to one unloading station (direct trains), to several stations of one section or to dispersion points.

Consigner unit trains are trains formed of cars loaded by one consigner at one station or on one access line by several consigners. Multistage unit trains are formed of cars loaded by different consigners at one station (station multistage trains) or by different consigners at several stations of a section or at a railroad junction (section multistage trains).

When shipping grain to several grain-receiving or grain-processing enterprises located at the stations of one section, unit trains should consist of a number of cars grouped according to the consignee's handling capacity. Although this is specified in the contract for operation of the access line or for delivery and removal of the cars, it should be kept in mind that there are shortcomings in this matter. Not all grain-receiving enterprises which ship grain by unit train know the specific technical unloading capacity of the consignees. For this the consignees

should indicate the maximum number of cars which can be unloaded at one time in the allocation certificates.

The list of dispersion points for unit trains carrying grain and of the areas of their operation is established by the Ministry of Railways in concordance with the USSR Ministry of Procurement.

The quarterly goals for shipment of grain by unit train are established in conformity with the Planning Rules. Monthly shipments of grain by unit train are planned on the basis of the quarterly goals.

In accordance with the Planning Rules, 14 days before the beginning of the month being planned the grain products administration must submit to the railroad administration plans, based on orders and allocation certificates received, for shipments of freight by unit train with an indication of the station of destination or station of dispersion for the unit trains. Missing the deadlines for submission of the shipment plans creates certain difficulties in organizing unit train shipments.

With the existing freight flow, the monthly plans for shipments of grain by unit train are drawn up by the branches of the railroad and submitted for approval to the grain products administrations. The stations and grain-receiving enterprises are notified of this plan three days before the beginning of the month being planned. Unfortunately, the branches of the railroads often do a poor job of formulating these plans without considering the loading zones necessary for unit train shipments, and the grain products administrations consent to these plans.

The railroad regulations specify that the railroad is obligated to load cars in good working order, suitable for shipping grain, cleansed of freight residues and rubbish and, where necessary, thoroughly washed and disinfected. It is categorically forbidden to ship grain in cars that are in bad repair and not suited to these purposes.

But owing to lack of an adequate number of cars and to delivery of cars which are unsuitable for the freight, grain is often shipped in single cars.

Often, because of lack of control by the directors of the enterprises and grain products administrations and because of ill-timed delivery of 10-day orders for shipment of grain by unit train, stoppages in their departures are permitted. Thus in 1978 480 consigner unit trains for which R 36,000 was paid were not loaded, and in 1979, 666 unit trains and R 49,000, respectively.

Some administrators of the union republic ministries of procurement, grain products administrations and the enterprises are underrating the significance of unit train shipments of grain and feel that the workers of the stations and railroad branches should deal with this matter.

Cases occur in which the grain-receiving enterprises do not provide for shipment of grain by unit trains because of inopportune organization of them with respect to the time stipulated by the contract or refuse a shipment specified in the calendar plan.

Sometimes consignment of single cars of grain to large enterprises capable of receiving grain by unit train is permitted. Such dispersion of unit trains is being permitted by the consignment points at the Orsha, Molodechno and Comel' stations (grain-receiving enterprises of the Belorussian SSR).

It also happens that grain-receiving enterprises, violating the established system, send unit trains of grain to one unloading point in bunches or to enterprises which have not been adapted for receiving them. As a result, difficulties arise during unloading, and overstatement of the cars' layover norm and, most important, loss of the effectiveness of routing in unit trains are permitted.

Construction of equipment for unloading specialized cars (grain freighters) is still inadequate. As of 1 January 1980, only 25 percent of enterprises had such equipment. The stock of grain freighters is increasing, but the rates of preparation for their reception and unloading are still inadequate.

In recent years large grain-receiving enterprises and elevators have been built in the country, however, some administrators of the union republic procurement ministries and grain products administrations are still planning grain deliveries to them without considering routing by unit train and are requesting that the USSR Ministry of Procurement reduce shipment of grain by direct unit trains (the Belorussian SSR, Latvian SSR and other Ministries of Procurement).

Many grain-receiving and grain-processing enterprises in the Uzbek SSR, Turkmen SSR, Tadzhik SS, Azerbaijan SSR, Estonian SSR and in Ivanovskaya, Kostromskaya, Ryazanskaya, Kaluzhskaya, Gorkovskaya, Novosibirskaya, Sverdlovskaya and Amurskaya Oblasts of the RSFSR are still not prepared to receive grain by unit train.

As of 1 July 1979 the USSR Ministry of Procurement had 410 enterprises capable of receiving grain by unit train. These are large enterprises for storing and processing grain which are equipped with powerful handling mechanisms. In some cases, however, these technical resources are not being fully utilized because of unsatisfactory planning of grain shipments.

The highest average annual percentage of coverage of grain shipments by unit train routing was achieved in 1976 (13.4 percent), and the highest average monthly percentage, in August of last year (44.3 percent).

Meanwhile there has been experience with good organization of grain shipments by unit train. Thus, the grain-receiving enterprises at the

stations of the Kustanay branch of the railroad make wide use of scheduled loading of multistage unit trains according to destination. The essence of the method is that the grain products administration and the railroad branch organize shipment of grain to the eastern regions on one day and to the western regions on another. After the cars are loaded with grain they are coupled to full unit train weight. This method ensures regular shipment of grain by unit train to the destinations. Thanks to such coordinated organization of switching and freight operations during the loading of the unit trains, the collective of the Amankaragay elevator not only reduced the layover of cars and fulfilled the plan for grain shipment but also received a prize of R 794 from the railroad in 1978 and R 3354 in 1979.

Other examples of well coordinated work by grain-receiving enterprises and railroad workers are the enterprises of the Kokchetavskiy, Orenburgskiy and Altayskiy grain product administrations, where the maximum scope of grain shipments by unit train was attained last year. During mass reception of grain, unit train shipments of grain comprised 40-50 percent of all railroad shipments.

From the above it is evident that organization of grain shipments by unit train in the procurement system has its own specific nature and difficulties: it is necessary to have an amount of grain sufficient for the daily volume of shipments to the destinations, high capacity loading equipment and developed track and switching facilities at the grain-receiving enterprises and to have the necessary receiving capacity at the point of destination. The merit of such organization of grain shipments is obvious, however. The freights are delivered by the unit trains to the place of utilization at the rate of 550 km/day, and individual cars at only 330 km/day, i.e., nearly twice as slow. Considering that a great amount of grain, flour, groats and mixed feeds is constantly in transit and that the average distance of shipment is as great as 1100-1250 km, the reduction of their transportation times makes it possible to speed up the delivery of more than 300,000 tons of grain freights in one day alone. Moreover, a car of grain in an ordinary freight train (not on a unit train) passes through three to four classification yards. The total layover of each car at these stations is 25-30 hours, and processing it costs the government from R 9 to R 12.

At the same time it is necessary to determine the effectiveness of the organization of unit train shipments in each specific case. It is expedient to ship grain by unit train in cases where the total number of car-hours of layover at classification yards en route is greater than the additional layovers during loading and unloading of the unit trains.

In order to increase the level of grain shipments by unit train, along with the creation of the technical and industrial conditions for this the level of organizational work must be improved, primarily in the grain products administrations. Business contacts with the organs of railroad transport must be strengthened; joint planning of work in

loading and unloading of cars should be organized; the results of the day's work should be examined jointly every day, and problems should be effectively eliminated.

In order for the plan for grain shipments to be fulfilled successfully, the enterprises to be steadily supplied with raw materials and the utilization of railroad rolling stock to be improved by increasing the proportion of grain shipments by unit train, the development plans must provide for the construction of elevator capacities with corresponding high-capacity handling equipment in regions of mass procurement of grain and high consumption of grain products. The enterprises must be equipped with unloading equipment with storage tanks over the railroad tracks in order to load cars with grain through overhead hatches. The construction of receiving equipment for unloading grain freighters and the equipping of enterprises with high-capacity unloaders must be speeded up. The operating technology of the enterprise and railroad station access lines must be improved in every possible way. The experience of the Dobele grain products combine and the Dobele station of the Baltic Sea Region Railroad, where a single industrial process for operating the access line and station has been introduced, should be more widely utilized for these purposes.

Resolutions of the November (1979) CPSU Central Committee Plenum and of the second Supreme Soviet session of the 10th convocation provide for allocating major capital investments to the development of railroad transport. It is very important in this connection to expand unit train shipments and strengthen the responsibility not only of transportation workers but also of the workers of the procurement system for effective utilization of transport resources.

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POST HARVEST CROP PROCESSING

IMPROVEMENT CALLED FOR IN TRANSPORT OF FEED YEASTS

Kiev SIL'SKIY VISTI in Ukrainian 6 Jun 80 p 2

[Article by M. Kolyada, special correspondent: "The Carload of Feed Yeasts: What is Impeding Introduction of the Package-Free System of Transporting Products"]

[Text] At the October distillery, which is in the city of Karlovka, 3,500-4,000 tons of feed yeast on the average are manufactured annually, depending on the yield of sugar beets. The yeast goes to the production of mixed feed for cattle and poultry. Previously 70-80 percent of it was delivered to the Poltava mixed feed plant annually, since it is some 60 kilometers from Karlovka to the regional center.

As a rule this important ingredient of mixed feeds was transported by railroad, but this often created a number of problems: now there was a shortage of packaging materials, now the cars were not delivered on time. The opposite also happened: the cars came in, but there was no one to load them. A brigade of loaders had to be hastily organized in order for the cars not to stand idle. And that cannot always be quickly accomplished.

This is when the local rationalizers, together with the director of the plant D. I. Shevchenko, and head engineer V. Ya. Kyrychenko started thinking about how to eliminate "bottlenecks" at the plants.

Supporting the initiative of the workers of Zaporozhskaya Oblast--"Manual Labor on the Shoulders of Machines"--the skilled craftsmen of the plant introduced the package-free system of transporting and storing feed yeasts. In order to do so they set up a mechanized loading line by themselves. But in order for it to operate, the distillery needed at least two special ZSK-10 vehicles.

Unfortunately, the administrators and specialists of the plant haunted the threshold of the Kharkov Production Association of the Spirits, Liqueurs and Vodka Industry and the Ministry of the Food Industry of the republic for more than a month requesting these vehicles. These were finally received in February of this year. Now 8 persons who

previously packaged the yeast, 12 who loaded it into the cars and 5 who unloaded it at the mixed feed enterprises have been freed at the plant. Moreover, the requirement for cars and paper packaging no longer arises. According to the experts' estimates, work productivity on transportation of feed yeasts increased by 21.4 percent, and the annual economic effect from the innovation is as much as R 26,000.

The UkrSSR Ministry of the Food Industry praised the Karlovka workers' experience and recommended it for introduction at other plants.

It would seem that a good initiative has been given wide scope and that we can finish with that. But it is turning out to be too early to do so, since a new "yeast center" has already been set up by other planning departments. The main administration of the mixed feed industry of the UkrSSR Ministry of Procurement ordered only 200 tons of feed yeast from the October Mixed Feed Plant, although there is a possibility of such shipments being increased four-fold.

The question arises: where will this ingredient be obtained for here, and where will the Karlovka feed yeast be shipped? As has become known, they plan to deliver hydrolytic feed yeasts to Poltava from Mariyskaya ASSR and Irkutskaya, Volgogradskaya and Kostromskaya Oblasts and alcoholic feed yeasts from Karlovka to Donetskaya, Voroshilovgradskaya and other oblasts. The cost of transporting a ton of such yeast from Karlovka to Poltava is R 39, but from, say, the city of Svetloyarskiy in Volgogradskaya Oblast it is R 142, and from the city of Manturovo in Kostomskaya Oblast, R 217.

The November (1979) CPSU Central Committee Plenum set workers in railroad transportation the task of finding additional reserves for increasing transportation and improving service to the national economy. And the railroad workers are searching for them. But what is happening at present? First, this failure to think things out in planning has eliminated the possibility of using the package-free method of transporting feed yeast at the October distillery, i.e., is forcing us to take a step backwards. Second, transportation costs for delivery of these products alone are increasing more than five-fold. For the hydrolytic feed yeast which is shipped miles and miles away (and it is significantly more expensive than alcoholic yeast), more than 800 tons of which was allocated to the Poltava Mixed Feed Plant for the second quarter of this year, costs the farms more than R 100,000 more than that manufactured and used on the spot. This has a negative effect on the production cost of the products of animal husbandry and on the economics of the farms. Are cross-hauls of feed yeast really justified?

"Most of the listed suppliers of feed yeast other than the October distillery often miss the deadlines for their deliveries, and this sometimes makes the plant hectic," the director of the Poltava Mixed Feed Plant, I. G. Tkachenko explained.

V. V. Iazyts'ka, acting director of the manufacturing and technical laboratory of the plant adds, "Yeast delivered from such a distance becomes compressed, and often funds have to be spent on breaking them up."

But what does the republic's ministry of procurement think about this?

"The question raised merits attention," said Assistant Director of the Ural's Main Administration of the Mixed Food Industry A. Ya. Pshchelina'kiy. "I don't guarantee that everything here is well thought out and planned efficiently. But considering the shortage of protein stocks for mixed feed we are trying to distribute the stocks of hydrolytic and alcoholic food yeast so that the planned formulas developed and approved by the Ministry for the first half of the present year are satisfied at all plants by a high-grade stock of mixed feeds."

It all seems to be clear: they are also concerned about highly efficient output of concentrated foods at the main administration. But certainly this should be done not at any price whatsoever but competently, carefully, economically, with an efficient, scientifically valid plan. Then neither the enterprises which manufacture feed yeast nor the farms which produce the products of animal husbandry will be the worse off for it. But this is not being taken into consideration.

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POST HARVEST CROP PROCESSING

MERITS OF GRAIN STORAGE IN METAL SILOS DISCUSSED

Moscow STROITEL'NAYA GAZETA in Russian 10 Feb 80 p 3

[Interview with Yu. Baranskiy, head engineer of Soyuzellevatorstroy Association by I. Svirin: "Metal Silos"]

[Text] Experimental construction of metal elevators has shown that they are less labor-intensive and more reliable to use than elevators with other design designs, and considerably less time is spent on their installation.

A year has passed since the USSR Ministry of Procurements has created the all-union association for the construction of elevators with metal silos: Soyuzellevatorstroy. Our correspondent, I. Svirin, asked the association's head engineer, Yu. Baranskiy, to discuss how the establishment of subdivisions of Soyuzellevatorstroy is proceeding and what the first practical steps of the collectives are.

[Question] Yuriy Panteleymonovich! A new subbranch is being created in elevator construction. Soyuzellevatorstroy is one of the participants in the development of this subbranch. Tell us, please, when the association's subdivisions will have the first metal grain containers ready.

[Answer] In order for the readers to have a clear idea of the volume of the work, I shall give a couple of figures. Already this year we shall begin the construction of 28 metal elevators with a capacity of almost 400,000 tons of simultaneous grain storage. We shall put 11 of these into operation, with a capacity of 154,000 tons.

Under the Eleventh Five-Year Plan the association should construct metal grain storage facilities with an overall capacity of 2.6 million tons. Moreover, we are committed to renovate and carry out capital repair on existing mixed feed plants, mills and other facilities of grain receiving and grain processing enterprises, and also to perform startup and adjustment work. The area in which our subdivisions are working is extremely great; with the

exception of the RSFSR we shall construct metal elevators on the territories of all the union republics.

[Question] What is the structure of the association?

[Answer] We are increasing the capacities of the 12 previously existing subdivisions at accelerated rates and we are constructing new ones locally. Last year we organized three specialized mobile mechanized columns and two trusts. The Elevatorremstroy Trust is organizing construction in Belorussia, Moldavia, the Baltic republics and the Ukraine, and the Sredaelevatorstroy Trust--in Uzbekistan, Kirgizia and Tadzhikistan. This year eight more specialized mobile mechanized columns will be organized as well as a trust in Alma-Ata.

A planning and design bureau has been created within the association. Its specialists are engaged in the development of economical metal structures and assembly devices, as well as the introduction of advanced technology for their manufacture at enterprises. The designers are also obliged to participate in the installation at the construction sites.

[Question] And how are your plans supported by material and technical resources?

[Answer] First of all, we are developing our own production base. Last year in Minsk we put into operation a shop for semimanufactured coils of strip metal for 180 silo set with an overall capacity for simultaneously storing 350,000 tons of grain. The construction of this enterprise is continuing. Next year we shall begin to construct an experimental mechanics plant in Tashkent. In a word, during three years we shall provide all construction organizations with powerful bases. They have already been allotted machines, mechanisms, equipment and automotive transportation for special purposes.

[Question] Tell us about the designs that have been accepted for production.

[Answer] Institutes of Glavpromzernoprojekt of the USSR Ministry of Procurement have developed three types of metal grain storehouses: made of rolled metal with capacities of 1,800 and 3,000 tons and also made of rolled sheets, which are being constructed by the coiling method, with a capacity of 3,000 tons. The latter method is preferable. It saves 13 rubles per thousand tons of capacity and 21 kilograms less metal is used. Silos made of rolled sheets can be constructed in only a couple of days with two machines--a sectioning machine and a seaming machine. The sequence of the work is as follows: they build the assembly circle on a circular foundation and then, using a folded seam, the machines join the steel strip and construct the cylindrical wall of the silo along a continuous spiral "from top to bottom." The speed of the coiling is 6 meters per minute. The machines are handled by 6-7 fitter-installers. There is no need for large-capacity cranes or special transportation here. The great efficiency of this method was con-

vincingly confirmed during the course of the construction of five silos of the Tiraspol' grain products combine.

[Question] You mean that no special problems arise?

[Answer] Not exactly. We are very concerned by the great labor-intensiveness of the work of zero cycle. Especially the construction of the troughs that are intended for the removing of the residual grain from the silos. Large expenditures of manual labor are required here and this reduces the economic effectiveness of metal elevators. We need the help of scientists and designers in order to solve this technical problem.

Now we have to use anticorrosive covering on the walls of the silos at the construction site. This should be done during the process of producing the rolled metal sheets at the enterprises of the USSR Ministry of Ferrous Metallurgy. Solving this problem will be repaid 100-fold.

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POST HARVEST CROP PROCESSING

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ADVANTAGES OF METAL SILOS OVER OTHER KINDS ENUMERATED

Moscow MUKOMOL'NO-ELEVATORNAYA I KOMBIKORMOVAYA PROMYSHLENOST' in Russian No 4, Apr 80 pp 41-43

[Article by L. Alekseyeva, candidate of agricultural sciences, N. Fomin, candidate of technical sciences, A. Lugarev, engineer of the All-Union Scientific Research Institute of Grain, V. Brovenko and G. Tyan, engineers of the Kazakh Branch of the All-Union Scientific Research Institute of Grain, and V. Gospadinova, candidate of technical sciences, Kuban' Branch of the All-Union Scientific Research Institute of Grain: "On Storing Grain in Metal Silos"]

[Text] A large program of construction of metal grain storehouses is presently being implemented in our country. As practice has shown, they can be used in all climatic zones for storing dry and cleaned grain.

Metal has higher coefficients of heat conductivity (λ) and heat diffusivity (a) than reinforced concrete does: for a reinforced concrete wall of a solid silo $\lambda=1.54$ Wt/m·K and $a = 0.8 \cdot 10^6$, and for a steel silo $\lambda=45.4$ Wt/m·K and $a = 12.5 \cdot 10^6$ m²/s. Therefore in metal grain storehouses with an ordinary wall, the peripheral layer of the heap of grain and the air in the space above the grain are more actively subjected to the effects of drops in the temperature of the surrounding air than they are in other grain storage facilities. On the territory of our country the temperature will fluctuate from 5-15 degrees centigrade in the course of a day, reaching 30 degrees centigrade in individual regions.

Such fluctuations in the temperature of the outer air have a significant effect on the condition of the grain in the peripheral layers of the heap of grain in a metal silo and can cause a reduction of the condensed moisture on the internal surface of the roof and walls of the silo and also a redistribution of moisture among individual sections of the pile of grain.

Therefore with extended storage of grain in metal silos it is necessary to control carefully the conditions of the surface layer of the pile of grain and the internal surface of the silo so as to promptly avert moistening of the grain, caking of the upper layer of the pile of grain and, as a result, deterioration of its quality.

Solar radiation has a significant effect on the temperature of the roof and walls of a metal silo and, consequently, on the peripheral layers of the mass of grain. Research under production conditions under various climatic zones of the country has shown that in sunny weather the temperature of the internal surface of the wall of a metal silo which is painted outside with aluminium paint can be 14-18 degrees centigrade higher than the temperature of the external air.

But, as a result of the low heat conductivity of the mass of grain, the effects of warming of the wall of a metal silo on the grain are limited to the layer of grain that is 15-25 centimeters from the wall. Sharper fluctuations in temperature are observed in the layer of grain that is up to 5 centimeters from the wall.

Investigations of storage conditions and the quality of 19 batches of grain, of wheat, corn and barley in various zones of the country showed that most of the grain is affected by the average monthly temperatures of the surrounding air.

In terms of the average monthly temperature observed in the grain, the main regions of production and distribution of grain supplies can be arbitrarily grouped into two large zones which are characterized by increased (above 20 degrees) average daily air temperatures during the summer period (Moldavia, the south of the Ukraine, the Caucasus, the south of Kazakhstan, Central Asia, and Southern Povolzh'ye) and the zone of moderate climate, which includes the other regions of the country.

Generalization of experiments in the use of metal grain storage facilities conducted by the All-Union Scientific Research Institute of Grain, with the active participation of workers of the Droklyevskiy Grain Receiving Enterprise (director--V. L. Timchenko, head engineer--M. P. Chichikov and laboratory chief--M. I. Dobrovols'kaya) and the Vileyskiy mixed feed plant (director--A. A. Bumovich, head engineer--A. I. Narkevich and laboratory chief--T. I. Krishkovskaya), made it possible to develop temporary instructions for storing grains in metal grain storage facilities, which have been approved by the USSR Ministry of Procurements.

The instructions formulate the basic rules for preparing metal grain storage facilities for receiving freshly harvested grain, give the conditions for storage and regulate the observance of the condition and the quality of grain during the process of storage, and also contain recommendations for ventilation and unloading masses of grain with overhead chutes.

When preparing metal grain storage facilities for receiving grain, the chief of the elevator (production section) in conjunction with the chief of the production (technological) laboratory must conduct a visual inspection of condition of the internal surface of the walls, roof and bottom, check on the correctness of the indications and the stability of the operation of the gauges of the temperature and the level of the grain, as well as the sealing

of the overhead chutes and the operating condition of the means of transportation.

When inspecting metal grain storage facilities for water penetrability, special attention must be devoted to the condition of the welded seams and the bolted joints of the silo, the places where the heat assemblies and deflectors are attached, the roofs and walls of the areas above the silo, the place where the lower cylindrical part of the container is joined to the base, and the airlines.

A simple method of estimating the water penetrability is to inspect the internal surface of the silo during the period of intensive (downpours) precipitation and after them (when the air temperature is consistently above zero). But this method depends on weather conditions and therefore in practice it is more convenient to combine it with careful inspection of the storage facility (from within) on a clear, sunny day (with closed hatches). In this case the water penetrability is estimated indirectly, from the absence of spots where light comes through (openings) in the roof and walls of the silo.

Additionally, the water penetrability of the silos can be determined by artificial sprinkling. Running water is sprayed on top of the silo so that it runs freely over the outer surface of the walls. One uses a special device for this whose main part is a metal "irrigation" pipe which is closed at the edges, 2 meters long with a diameter of 25 millimeters and with openings that are 2 millimeters in diameter and are located 50 millimeters from one another. In order to release the water in the middle of the pipe there is a threaded nozzle which is joined to a firehose by a flexible connecting piece. The "irrigation" pipe is suspended in the upper part of the silo at a distance of 20-30 centimeters from the wall in such a way that the axis of the openings is at a 60-70 degree angle from the wall of the silo. The sprinkling is done in individual sections of 2 meters and then the installation is moved. The expenditure of water is 10 liters per minute per one running meter of wall of the silo and the sprinklings last 30 minutes at a time. The roof of the silo is sprinkled similarly.

The commission for receiving grain storage facilities supervises the condition of the coverings that protect the roof and walls of grain storage facilities from the outside and inside. From the results of the inspection of each metal silo a document is drawn up with an appendix indicating the defects, and it also shows the volume and nature of necessary repair work and the deadlines for carrying it out.

When preparing metal storage facilities for receiving grain from the new crop and each time they are emptied it is necessary to carefully clean the walls and bottom of residuals of grain and dust, and when it is discovered that the grain is infected, disinfection must be carried out. An effective means of preventive treatment of empty metal grain storage facilities is to use Gamma disinfectant bombs.

Pesticides that harm metal (preparation 242 and others) can not be used.

Cleaned and dried grain that is intended for storage for more than four months (especially in the southern regions of the country) should be treated with a stream of carbophos. Here one selects a dose of carbophos (from 8 to 15 grams per ton), depending on the temperature, moisture content and proposed time of storage of the grain, in keeping with the temporary methodological instructions for the application of carbophos for decontaminating grain so as to eliminate pests of grain supplies.

A good deal of attention should be devoted to preparing the overhead chutes. Before placing the grain in storage one should carefully clean the surface of the grates of the overhead chutes, the cutters and the protective deflectors so as to remove residuals of grain, dirt and dust; chaff grates and other elements of the bottom that are out of order should be repaired or replaced; and one should inspect for the sealing of the joints of the chaff grates and the water lines and also the operation of the fasteners and the uniformity of the height of the chaff grates.

The sealing of the joints of the chaff sieves and the uniformity of the height of the chaff grates are determined according to the uniformity of the "boiling" of the layer of grain with a thickness of 8-10 centimeters.

The air lines of the overhead chutes and the ventilators should be joined with a flexible connector between the nozzle of the ventilator and the feed duct of the overhead chute.

The pumping nozzles of the ventilators which are located outside the metal grain storage facilities should be equipped with canopies to protect them from atmospheric precipitation.

In order to provide for reliable control of the temperature of the grain that is being stored, it is necessary annually to check and adjust the thermometric system. The correctness of these thermometers is inspected immediately before loading the silos with grain. Here the indications of the gauges should not differ from one another and should correspond to the temperature of the air within the storage facility.

The time periods for storing grain in metal grain storage facilities has been established, depending on the moisture content and the crop (see Table).

Cleaned and dried grain is loaded into metal silos.

During the process of storage it is necessary to regularly check the temperature of the grain mass and to cool it if necessary.

The temperature of the grain is checked twice a week. When the temperature of the grain is less than one degree centigrade it can be less frequently (once a week). The results of the observations of the temperature and the

data concerning the ventilation of the grain are entered in a journal which is kept for each container individually.

Table. Maximum Permissible Time Periods for Storing Grain in Metal Grain Storage Facilities (Months)

Moisture Content %	Up to 13, inclusive		Above 13, to 14 inclusive		
	Storage zone				
	Crop	Southern*	curements of grain, except southern zone	Southern*	curements of grain, except southern zone
Wheat	12	24	6	12	
Barley	6	12	3	9	
Corn	6	9	3	6	

*The southern zone includes Krasnodarskiy and Stavropol'skiy krays, Lower Povolzh'ye, the Moldavian SSR, the south of the Sazakh SSR, the south of the Ukrainian SSR, and the republics of Central Asia and Transcaucasia. (In the event that indications of deterioration of the quality of the grain are discovered before the indicated deadlines, the batch should be cooled, dried and sold.)

Samples for evaluating the condition and the quality of the grain should be taken when it is put on to the transporter, both when it is being shipped in and during the process of storage and at the time of dispatch. In order to select samples it is necessary to have a reserve container. The grain can not be placed in the same silo.

Taking into account the fact that the most unfavorable storage conditions (sweating of the surface of the pile of grain, roof and walls) appear mainly in the upper layer of the pile of grain, it is recommended that the surface of the pile of grain be inspected periodically (when the grain temperature is above 10 degrees centigrade), no less than once every two weeks, using a flashlight for lighting.

In doubtful cases (when certain sections of the pile of grain turn dark, an odor appears which is not usually found with healthy grain, the temperature of the grain increases sharply, and so forth) it is recommended that a sample of the grain be taken from the surface of the pile, with mandatory observance of the requirements of technical safety. For convenience in taking the sample, it is necessary to have a stationary or portable ladder.

The implementation of the aforementioned measures for preparing metal silos, selecting and storing up batches of grain of the required quality and systematic control of its quality during storage is a mandatory condition for ensuring that the grain is preserved properly in metal grain storage facilities.

From the editorial staff: we request that specialists share on the pages of this magazine their experience in storing grain in metal storage facilities and express their opinions about the recommendations regarding the use of metal silos that have been presented in the article.

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LIVESTOCK

A MULTIFACETED APPROACH TO LIVESTOCK PRODUCTION

Krasnodar SEL'SKIYE ZORI in Russian No 3, Mar 80 pp 10-12

[Report on a livestock conference for the North Caucasus and Central Chernozem Zone by Special Correspondents G. Borovik and Yu. Chervonyy]

[Text] Agricultural enterprises in the North Caucasus and Central Chernozem Zone make a major contribution to satisfying the ever-increasing foodstuff requirements of the Soviet populace. There are ways in which they can bring about large increases in milk and meat production and in stocks of these products.

Various aspects of expansion of the livestock industry and enhancement of dairy-product and beef production were considered in the light of the decisions of the November (1979) Plenum of the CPSU Central Committee and the recommendations embodied in L.I. Brezhnev's speech to the Plenum at a regional conference of stockmen from the North Caucasus and Central Chernozem Zone held in Rostov-on-Don.

Participants in the conference included leading figures from the industry, farm supervisors and specialists, personnel from party, local-government and agricultural organizations, and scientists.

The conference was opened by First Deputy Chairman L.B. Yermin of the RSFSR Council of Ministers.

Hero of Socialist Labor Academician A.V. Cherekayev (VASKhNIL) presented a paper.

Cherekayev emphasized that the main factor in increasing the output of animal products is creation of a stable feed base through the most efficient possible use of natural hayfields and pastures and a rise in the proportion of green chop and hay in cattle rations. An important role is played by commercial introduction of feed-preparation methods that enhance nutrient value, palatability, and assimilability for such feeds as straw, sunflower stalks, corn stover, sugar cane and other horticultural wastes.

An important means for improving the cost-effectiveness of dairying and beef production is still provided by intensification of herd reproduction and rearing of first-rate replacement animals. The number of calves produced per hundred cows still does not exceed 74-75. There are many reasons for this, including failure to make adequate use of artificial insemination, the occurrence of major epizootics among young stock, and a high incidence of infertility among maternal herds. Approximately 30 percent of cows have a service period lasting 90 days and it is known that each additional month of rest beyond 3 months after calving leads to reduction of 6 percent in annual milk yield. This alone produces an annual milk loss amounting to 39,000 tons in the Central Chernozem Zone and about 46,000 tons in the North Caucasus.

Ye.I. Martynyak, the insemination technician of the Kolkhoz (Primorsko-Akhtarskiy Rayon, Krasnodarskiy Kray) shared his experience in the high-productivity utilization of a maternal herd. Over the past year, this farm has marketed 98 quintals of meat, 448 quintals of milk, and 28 quintals of wool per 100 hectares of agricultural land. Each cow produced 3515 kg of milk and one calf. The cattle-breeding farm that has been supervised by party member P.P. Dublya for more than 12 years has also had consistent production figures. One hundred or more calves have been obtained per 100 cows in 8 of the last 10 years. The official production of young stock has been increased to 104 head. Prevention of infertility begins in the farm's calving section. All the cows are given a course of vitamin therapy. Uterine massage is begun on the 7th day after calving and repeated weekly until the onset of heat. Cows suffering from endometritis are treated with furazolidone, activated streptocidal emulsion and other drugs. The model program of zootechnical and veterinary monitoring carried out at the farm permits immediate detection of infertile diseased animals and timely initiation of therapeutic measures.

Judging from the experience of leading farms, the milk yields of primipara heifers inseminated at the stipulated times, on reaching live weights of 350-360 and 380-400 kg, are 4000-4500 and 5000 kg per lactation respectively. The calves born to such primiparas, when reared under intensive conditions, are not inferior in production or breeding characteristics to their age-mates born to mature cows.

The close relationship between the age at which a heifer is first inseminated and future productivity has been confirmed by the experience of the Lenintsy Kolkhoz (Mayskiy Rayon, Kabardino-Balkarskaya ASSR), which was discussed by its chairman, D.V. Arkhangel'skiy. Livestock production has been consistently profitable at this farm for many years. It operates a dairy with a herd of a thousand cows, in which all labor-intensive processes have been mechanized. The per-animal yield in 1979 was 3079 kg. The operations obtain no less than 95-100 calves per 100 cows and the calf survival rate is high. As a result of the stable feed base, proper selection and placement of personnel, and use of good breeding practices, the

basic maternal herd at the kolkhoz has an annual replacement rate of 25-30 percent; the replacement animals are high-scoring primipara heifers with a production level of 3500 kg for their first lactation and a live weight of no less than 450 kg. The workers in the livestock division have now set themselves the goal of achieving a milk yield of up to 3500-3600 kg per cow for the entire herd and of producing no less than 700 quintals of milk per hundred hectares of agricultural land.

In order that the output of milk, meat, and other products of animal origin can be consistently increased in a planned manner, Prof. V.S. Shipilov (head of the Department of Zootygiene and Veterinary Medicine of the Moscow Agricultural Academy imeni Timiryazev) recommended that producers pay attention to such aspects of the correct organization of reproduction as synchronization of calving, intensive rearing of heifers at specialized feedlots or farms, and insemination of animals as young as 16 months. Intensive rearing of replacement heifers is being purposively and efficiently carried out in many areas of the North Caucasus and Central Chernozem Zone. Intrafarm specialization is being implemented in some districts, where facilities for rearing of young heifers and for monitoring and selection directed at improvement of milk yields are being established at each kolkhoz and sovkhoz. Other rayons are organizing separate facilities for rearing of heifers, from which replacement animals are to be dispersed to dairy farms. The facility at the Kolkhoz imeni Chapayev (Kochubeyevskiy Rayon, Stavropol'skiy Kray) has achieved good results each year. O.A. Zakharova, the operator of the first section, where heifers are reared from 10-20 days to 9 months of age, reported that the facility purchased more than 11,000 head of young cattle and sold about 6000 six-months-pregnant heifers to farms over the first 4 years of the 10th Five-Year Plan. The average weight at the time of sale was 400 kg. The staff of the facility achieved excellent quality indices in 1979; 88 percent of the heifers met grade, elite-record, and elite requirements and there was no below-grade stock. The average live weight of these heifers was 420 kg.

An example of efficient rearing of replacement animals, preparation of heifers for calving, and improvement of the milk yields of primiparas is provided by the stockmen of the Gornyyak State Breeding Farm (Rostovskaya Oblast) and the Urupskii and Ventsy-Zarya State Breeding Farms (Krasnodarskii Kray). Here Red Steppe cows in their first lactation give 3350-4000 kg or more of milk with a butterfat content of 3.60-3.83 percent, which is close to the genetic potential of the breed.

Dairy-herd production levels can be increased without additional expenditure of labor and feed by use of herd-improving sires. Breeding facilities in the Central Chernozem Zone and North Caucasus have about 2200 stud bulls, but trials based on offspring quality have been conducted for only slightly more than 80 head and only 46 have been recognized as herd improvers. As was emphasized by the participants in the conference, the

role of breeding farms and sovkhozes raising elite animals of the breeds in which they specialize, particularly stud bulls, has therefore now become immeasurably more important.

The need for improvement of the selection and breeding techniques employed for major cattle breeds was specifically discussed by Dr. M.D. Dedov (a department head at the All-Union Institute of Animal Husbandry), I.F. Bova (the director of the Rostov Breeding-Sovkhoz Trust), and N.N. Novikova (the chief zootechnician and breeder of the Yelanskiy State Breeding Farm in Voronezh and recipient of an RSFSR award in zootechnics). The Yelanskiy facility evaluates the daughters of all stud bulls on the basis of such traits of breeding value as milk yield, milk butterfat and protein contents, live weight, production return on feed utilized, milk letdown rate, completeness of stripping and udder conformation. In recent years, high offspring quality scores have been received by the bulls Monolit-4262, Lakmus-5481, Klarnet, Kiparis, and Drozd, which have been recognized as champions and (in the case of the latter three animals) record-holders for the Simmental breed; all these sires have been designated as the originators of new commercial lines. More than 4500 high-grade bulls have been marketed by the facility during the period of its operation. About 60 percent of the stud bulls at breeding farms in Voronezhskaya Oblast now derive from the Yelanskiy State Breeding Farm.

The speakers noted that the results given by rearing of stud bulls and heifers and the production levels for cows depend on the feed base. Many of the farms in the North Caucasus and Central Chernozem Zone still do not have adequate per-head feed stocks. Millions of rubles are being expended on the establishment of cultivated hayfields and pastures, but their yields remain impermissibly low as a result of improper exploitation patterns. This reduces the hay supply and the amount of forage available, forcing the supervisory personnel of kolkhozes and sovkhozes to increase the amount of concentrates in the rations fed. Although science and practical experience indicate that it is possible to obtain 2500-3000 kg of milk per cow when the ration contains only high-quality hay and succulent feeds, the same levels can be achieved at farms with moderate-quality feeds by feeding of no more than 200-250 g of concentrates per kilogram of milk. A high-concentrate diet disrupts rumenal digestion and reproductive physiology and reduces the insemination rate.

Feeding of biologically complete rations balanced with respect to protein can aid in increasing milk production and reducing the consumption of forage, which is in short supply. G.P. Razumovskiy (the chairman of the Krasnodarskiy krayispolkom) reported that measures being taken in this direction in the Kuban area include expansion of perennial-herbage plantings; plantings of peas have been expanded to 150,000 hectares and those of soya to 25,000 hectares. As much as 30,000 hectares have now been set aside for winter rape, which gives green fodder in early spring. Agrotechnical requirements based on scientific recommendations are being strictly observed

In the cultivation of forage crops and progressive feed-preparation methods are being introduced. Average annual grass-meal production in the kray has risen by 82,000 tons in comparison with the level for the 9th Five-Year Plan, while roughage stocks have increased by 163,000 tons and silage stores by almost a million tons. The proportion of artificially dried and pressed hay has risen to 36 percent. There has been an increase in the amounts of hay-crop silage and grain silage in special storage facilities. About 60 regional and interfarm laboratories monitor the quality of stored feeds. On the whole, average annual stocks of high-grade hay have doubled, grass-meal stocks have increased by 23 percent, and silage stores have risen by 20 percent. Wide use is being made of wheat chaff, sunflower heads, sugar-beet tops, food-processing wastes, byproducts from the meat and dairy industries, amide preparations, and other feed components. Feed-preparation facilities have been organized at all farms and this is increasing the efficiency of forage utilization. However, the kray is experiencing an acute shortage of mineral supplements, trace elements, and drugs. During the past year alone, farms have had a shortfall of 15,000 tons of salt and 27,000 tons of nutrient phosphates.

Considerable work on feed-base stabilization has been carried out at the Rossiya Kolkhoz (Novoaleksandrovskiy Rayon, Stavropol'skiy Kray). The chairman of the kolkhoz, V.F. Vrana, reported that the areas planted to various crops have been modified, starting last year; this was done in order to implement the program for expansion of livestock production and to ensure more intelligent, biologically complete, and cost-effective feeding. It has made it possible to reduce the proportion of concentrates in the cattle rations from 25 to 18 percent, a decrease compensated for by use of more green and succulent feeds. The protein shortage is being covered by raising the proportion of legumes (peas and soybeans) in the concentrates to 12 percent and the proportion of high-quality grass meal to 3.5 percent. Addition of carbamide to corn silage, preparation of hay-crop silage from a legume-grass mixture, and use of yeast in concentrates permits replacement with vegetable feeds of up to 50 percent of the feeds of animal origin that must presently be purchased. Feed production has been accorded the status of a separate division, the area under irrigation has been expanded, and the kolkhoz field-crop staff is continually increasing fodder production.

The importance of increasing ration quality through use of carbamide, ammonia water, diammonium phosphate, and other chemical additives was addressed by N.D. Novikov (chairman of the Lipetskiy obispolkom). Virtually all coarse and concentrated feeds used in the oblast are processed beforehand and fed in finished form. Facilities presently in operation at farms include 30 bulk-feed plants of the OKTe type, more than 500 feed-preparation shops, and about 40 extruders for production of amide-concentrate supplements; a plant for preparation of salt-mineral pellets is being built.

P.R. Tedev (Minister of Agriculture of the Severo-Osetinskaya ASSR) and G.G. Fen'yeva (the chairman of the Put' k Kommunizmu Kolkhoz, Shelkovskiy

Rayon, Checheno-Ingushskaya ASSR) familiarized the participants in the conference with the efficiency of the continuous-milking-parlor system for milk production. Elements of the new production technology are in place at 70 percent of the dairy farms in the Severo-Ostenskaya ASSR. Four sections have been organized at the Put'k Kommunizma Kolkhoz: housing for dry cows and heifers, a calving section, an insemination section, and a commercial dairy. Narrow specialization of workers, evaluation of the physiological condition of the animals, and feeding of rations appropriate to each phase of the lactation cycle have made it possible to increase per-head milk production by 1240 kg over a 3-year period and to obtain 95 calves per 100 cows. Production per cow amounted to 3370 kg in 1979 and the milk-output quota was 110 percent fulfilled.

Experience in obtaining high milk yields at the Artemovets Breeding Sovkhoz (Oktyabr'skiy Rayon, Rostovskaya Oblast) was shared by milker Z.I. Ozerova. Forty expert machine milkers were able to cope with increased quotas and obtained 3664 kg of milk per cow; 12 milkers surpassed the 5000-kg mark. This farm exceeded its milk-marketing quota for last year by 31 percent.

Major steps to intensify beef production have been taken in all rayons of both zones since the March (1965) Plenum of the CPSU Central Committee. Hundreds of large and small feedlots have been built. Industrial technology made it possible to increase labor productivity and to raise mean weight at time of sale to 350 kg at the farms of the Central Chernozem Zone and 375 kg at those of the North Caucasus.

P.P. Chubov (First Secretary of the Kanevskiy raykom, Krasnodarskiy Kray) and V.V. Isayeva (General Director of the Tambov Agricultural-Industrial Association) advanced the view that there is an urgent need to begin commercial beef production with 20-day calves, which will reduce fattening time by 3-6 months. In this case, steers are delivered to packing plants at 16-18 months of age, with a live weight of no less than 450 kg. In order for the new technology to come into wide use, it is necessary that the production of bulk-feed ingredients for dairy calves be increased and that more equipment for production of whole-milk replacer be manufactured.

V.M. Reprintsev (the chairman of the Rodina Kolkhoz, Sovetskiy Rayon, Kurskaya Oblast) and N.V. Doroshenko (the chairman of the Kolkhoz imeni OI'minskiy, Alekseyevskiy Rayon, Belgorodskaya Oblast) consider the creation of a stable feed base to have been the main achievement of their staffs. The Kursk stockmen use the largest possible amounts of beet pulp, molasses, and sugar-beet tops in their rations. About 1000 hectares are planted to sugar beets and each hectare gives about 50 quintals of feed units for this purpose. The Belgorod stockmen prepare moist feed mixes consisting of molasses, technical-grade fats, oil-seed cake, chopped straw, and mineral supplements. Liquid vitamin-mineral supplements and liquid nutrient mixes are also manufactured. A shop for thermochemical treatment of straw was set up here in order to reduce the proportion of concentrates in rations. Exposure to

caustic soda increased the nutrient value of the straw by a factor of 1.5 and improved its digestibility by 27 percent. The proportion of roughage in the rations used at present has been brought to 30 percent in (in terms of nutrient value).

Beef production is expanding rapidly at the kolkhozes and sovkhozes of Rostovskaya Oblast. Specialists and scientists in Zimovnikovskiy Rayon have developed multibreed crossing techniques in order to produce high-yielding crossbreeds. G.I. Besuglov (Director of the Zimovnikovskiy Fattening Sovkhoz) reported that four-breed crosses (Red Steppe x Kalmykaya x Charolais x Maine-Anjou and Red Steppe x Simmental x Charolais x Maine-Anjou) have mean daily weight gains of up to 1800 g at ages of from 3 to 6 months.

All the finished cattle from the Temiraul'skiy Sovkhoz (Kizilyurtovskiy Rayon, Dagestanskaya ASSR) are extremely well fattened. A.A. Radzhabov, the farm's chief zootechnician, attributes its success to improved organization of the fattening process. A special group is responsible for each group of steers and every worker in the group has an interest in obtaining good results, so that he functions willingly and efficiently. The per-animal market weight in 1979 was 397 kg and the mean daily weight gain exceeded 800 g.

L.B. Yermin, First Deputy Chairman of the RSFSR Council of Ministers, addressed the conference.

Other participants included A.P. Popov (a sector chief in the Agriculture Department of the CPSU Central Committee and G.S. Ogryzkin (Deputy Minister of Agriculture of the RSFSR).

Those attending the conference unanimously approved a letter of welcome addressed to L.I. Brezhnev, the general secretary of the CPSU Central Committee and the chairman of the Presidium of the USSR Supreme Soviet.

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TILLING AND CROPPING TECHNOLOGY

NEWSPAPER SERIES ON SWEEP TILLAGE REVIEWED

Kiev SIL'S'KI VISTI in Ukrainian 28 May 80 pp 2-3

Article by F. Morhun, First Secretary Poltavskiy Okkom, Ukrainian Communist Party on: "Sweep Tillage: Experience, Prospects"

Text Last year an article by the First Secretary of the Poltavskiy Okkom, Ukrainian Communist Party, F. T. Morhun "Friendship Between the Field and the Sweep" was printed in four issues of our paper (17, 18, 20 and 21 July). The article stimulated wide response evident in later issues of "SIL'S'KI VISTI" and in the numerous letters received by the author himself. For those who participated in the article discussion, the Poltava area experience represented a means of fundamental change in land farming practices by extending the use of sweep soil tillage.

Today the editors again let F.T. Morhun speak. This time he generalizes the discussion summary and adds supplemental information resulting from new directions in improving sweep tillage on farms in the Poltava area.

An account of the Poltava area experience was the basis for the article "Friendship Between the Field and the Sweep". It dealt with the fate of the 1980 winter crop harvest which originated in conditions of an unusually droughty summer. Only a truly creative approach to tilling the predecessors for winter wheat could solve the problem.

Therefore, the quick reaction to the article by winter wheat expert, twice Hero of Socialist Work, Director of the "Pro-niva" Scientific Research Institute on Selection and Wheat Growing, Academician V. V. Nemesko was perfectly understandable to me. Vasyl' Myklayevych, with his understanding of factual essence, using important arguments from the experience of Poltava farmers and citing conclusions by erosion scientists stated unequivocally: "Surface tilling provides a second breath for winter wheat because it guaranteed the appearance of even sprouts within better agrotechnological dates regardless of weather conditions in the fall. This condition made me an active supporter of the sweep system tillage."

It is well, indeed, that the republic's farmers listened to the voice of experience in agricultural science. The Poltava area, where a special seminar was held in accordance with a decision by the CC Ukr Communist Party, was visited by representatives from all oblasts. They saw with their own eyes that sweep equipment prepared the soil much better for sowing than the plow even after most unfavorable predecessors. Those who correctly evaluated the Poltava area experience were able to conduct pre-sowing tillage sooner and obtain even sprouts with less valuable moisture loss.

On the other hand, as we expected, a much wider problem - the general prospects for sweep tillage became the subject of discussion also.

Specialist and farmer responses from our oblast and from others also point to the interest with which the article entitled "Keys to Field Fertility" was generally received. The author of the article, doctor of agricultural sciences, professor and chairman of the Soil Science and Geology Department of the Ukrainian Agricultural Academy N. K. Shykula provided concrete evidence for the use of sweep tillage in the future.

✓ "SIL'S'KI VISTI" pages provided also other convincing statements from scientists. The head of the Novosibirsk Strain Testing Station, honored Ukr SSSR agronomist, candidate of agricultural sciences I. I. Sanchertak, in particular, was completely justified in stating that experience has proved the advantages of sweep tillage. In the eighteen years of station experience he has accumulated perhaps the most important scientific data in our republic dealing with the effect of surface tilling equipment on the yield of various crops, the amount of weeds in the fields, etc.

The article "Cherkassy Area Experience" may be called a fusion of scientific thought and production. I am an agronomist and party worker, I am always very interested in the experience of farmers and scientists in Cherkasskaya Oblast. It was these people who expressed themselves for surface soil tillage and at the same time shared their extensive experience in tilling the predecessor for peas.

It should be noted that the response geography was markedly expanded by the letters I received from Odesskaya and Donetskaya Oblasts, from Postovskaya, Central-Chernozem Oblasts of RSFSR, also from Moldavia and Belorussia.

Returning to what was printed, I would like to provide some essential supplemental data to the already familiar to the reader Poltava area experience in introducing and improving sweep soil tillage.

There was no rain last year from April 23 until July 7 in the territory of our oblast. Plants also suffered because of an unusual air dryness. In these conditions crops in areas of sweep tillage withstood the weather conditions better.

In the experimental farm of the Poltavskaya Oblast Research Station winter wheat after sweep tillage yielded 51.6 quintals of grain per hectare, whereas after plowing only 41.3 quintals. In the kolkhoz imeni Zhdanov, Lubenskiy Rayon, harvest increase on fields tilled without plows amounted to 9.4 quintals, in the kolkhoz "Druzhba", Kozel'shchinskiy Rayon - 8.9 quintals, in the sovkhoz imeni Krups'kyy, Globinskiy Rayon - 10.2 quintals, in the sovkhoz of the Veselonodil'skiy sugar combine 12.7 quintals were harvested per hectare.

The new technology assured an increase of 8.8 quintals per hectare on farms in the Gadyatskiy Rayon, 7.7 quintals in Beshetilovskiy Rayon, 6.5 in Khorolskiy Rayon, 6.1 in Lubenskiy and 5.2 quintals per hectare in Lokhvitskiy Rayon.

Spring barley yielded a considerable harvest after sweep tillage. At the kolkhoz imeni Bohol', Mirgorodskiy Rayon, fields prepared using the new method yielded 33.8 quintals per hectare against 18.1 quintals from plowed fields. Each hectare of the barley field after sweep tillage yielded an additional 9.4 quintals at the experimental farm of the Poltavskaya Oblast Research Station, at the kolkhoz imeni Illich, Lokhvitskiy Rayon 8.3 quintals, at "Zorya", Piryatin-skiy Rayon 10.1 additional quintals of grain.

In the six years since the introduction of the new technology of soil tilling, the oblast obtained an additional 504,000 tons

of grain and an income of 45 million rubles. Actual facts convinced Poltava farmers that this method yields excellent results.

Summing up the discussion, I would like to consider two fundamental questions in agrotechnology which, up to now, are given completely opposite explanations by the proponents and opponents of the new technology.

Some scientists simply insist while experienced specialists planning to start sweep tillage openly express a fear that without the plow weeds will multiply markedly infesting fields and crops. The first must be told a definite 'no', and the second group must be assured that nothing of the like will happen.

Sweep tillage is much more effective in combatting weeds. Even more, research on our farms and scientific-research institutions has shown that sweep-like machinery available on a farm, which the agronomer may use according to the real needs in the field, gives him the opportunity to lower weed infestation by one and a half to two times compared to plowing. But the idea of plow tillage is still quite alive and its proponents are anxious to find fault with surface tillage. Now they say: We agree that the sweep can take care of annual weeds and sow-thistles...

It is absolutely clear for all those who have already worked with the sweep that no other equipment assures better methods of removing sow-thistles from the fields. Contrary to the plow, the sweep allows for repeated and varying depth field tillage with minimal moisture losses. The sweep can combat thistles without the use of herbicides. It might as well be remembered that weeds are not found on farms with poor equipment but rather on farms where there are poor agronomists.

Sweep opponents claim also that the plow is the only equipment which can be used for covering manure with soil. At this point, whether you want to or not, you must use a plow unit. But the problem must be presented differently: As much manure should be applied as possible, and the agronomist must decide what equipment should be used. When the time comes for manuring it should be taken out and plowed in. But this can be managed without plows also. At the kolkhoz "Bil'shovys'ka ratsya" and "Progres" in Karlivskiy Rayon, on a number of farms in the Lohivitskiy, Novosanzharskiy, Chutivskiy and other rayons in the Poltava area very good results are obtained from top dressing the soil with manure during sweep tillage.

This is com. I. I. Martynets', agronomist at the kolkhoz "Pil'shovyt's'ka Prataya" solved the problem on a 70-hectare field for the 1979 harvest of winter wheat. The area required additional top dressing since it was covered by stubble and winter crops had to be sown there. In the beginning disk-type stubble mulchers were used distributing mechanically 35 tons of organic fertilizer calculated per hectare; later the field was again tilled. After that a unit consisting of cultivator-sweeps and needle harrows was sent over the field. The fertilizer and the layer of soil were well mixed to a depth of 10-12 cm as needed. The well prepared field thus yielded an additional 5 quintals of grain per hectare (compared to areas tilled with plows).

Sweep tillage does not restrain, on the contrary favors field improvement. The following summarizes data from the oblast. Compared to the beginning of 1970-ties our kolkhozes and sovkhozes now utilize every year almost 6 million tons of local fertilizer more than previously. Last year almost 15.5 million tons were transported to the fields, or almost 9 tons per hectare of arable land. Therefore, a definite possibility exists for top dressing two fields in crop rotation instead of one. This is the result of sweep tillage.

In a number of oblasts, the Poltavskaya among them, this year some individual areas of winter wheat crops after unfallow predecessors were damaged by grain click beetles. Sweep opponents tried to tie this in to surface and sweep soil tillage. The reason, however, does not lie in the method of soil working, but in allocating winter crops after stubble predecessors. Scientists and specialists confirm this. Recently, the author received a letter from the director of the Prysyvats'ka Agro-Forest-Reclamation Research Station, doctor of agricultural sciences V. V. Ylozerov who writes about the high effectiveness of sweep tillage in Khersonskaya oblast and states:

"This year we noted the loss of some winter crops after unfallow predecessors because of click beetles. Many agronomists and kolkhoz and sovkhoz managers blame this on surface and sweep tillage. Our observations, however, show that where timely surface or sweep soil tillage was accomplished and there were no weeds or fallen grain, the condition of winter crops after unfallow predecessors was good, and crop damage due to click beetles was nonexistent or minimal.

Where soil tilling was delayed and weeds and fallen grain were present spring click beetles destroyed winter crops on surface tilled fields as well as those worked with a plow.

For greater effectiveness surface and sweep tillage must be accomplished within specific times, utilizing complex units with a cultivator-sweep, 310-3 narrow and a cultipacker. We saw a unit like that at the republican seminar in August 1979 in Poltava, used it and the results are excellent. There the complex unit was used winter wheat plant development, their sowing density after unfallow predecessors, is in no way less effective than fallow wheat, there is almost no plant loss because of click beetles."

Now proponents, giving in somewhat recently with respect to the grain field, now center their discussion on the sugar beets. We can even hear their call: "We will save beet plantations from the sweep! The question comes up: Why should the sugar beets be "saved"?

The basic argument for these statements is that organic fertilizer cannot be applied under the sweep. But we have already discussed this problem above. Let me add, manure covering utilizing sweep technology is no longer experimental, and is being widely applied in production. For example, 3.9 thousand hectares of oblast ploughland were prepared in this manner for the 1980 sugar beet harvest.

Research results conducted at the Veselopodolyans'ka Research Selection Station back in 1974-1976 provided the basis for the conclusion that sweep tilling does not lower the beet harvest, in fact, a tendency may be observed towards an increase in beet sugar content. Later Poltava area scientists conducted new experiments including ten different variants of equipment and operational procedures. Summarizing 1978-1979, seven versions of sweep tillage also yielded an increase in the sugar harvest per area unit.

All other versions yielded about the same level of sugar raw material, but the sugar content of beet roots after sweep tillage was 0.5-0.6 percent higher than after plowing. Sugar harvest per hectare was 1.6-4.4 quintals higher. Sweep tillage losses were considerably lower than from deep plowing.

Another matter should be noted. During the last five years, in conditions of wide sweep soil tillage practice, the gross production of sugar beets in the Poltava area increased by 31 percent. This is the largest increase in all the oblasts of the republic. Considering the fact that Poltava area farmers have not yet utilized all the reserves of the beet fields, we nevertheless have a basis for stressing the positive effect of the new technology on the production increase of this valuable raw material.

Having considered this extensive experience on the introduction of sweep tillage, specialists from all farms in two rayons Karlivskiy (in the transit zone between the Steppe and Forest-Steppe Zone) and Lokhvitskiy (border Forest-Steppe and Polissya) decided to change over completely from plowing to sweep tillage agriculture. Even more, almost the whole Poltava area is ready to take this new step as was indicated in the discussion of this decision at the recent oblast scientific production conference, providing there is enough sweep equipment available.

Unfortunately, none of the sweep tillage opponents took part in the discussion of the article "Friendship between the Field and the Sweep" on "SIL'S'KI VISTI" pages. A work dispute, an open confrontation of opposing thoughts is always beneficial. It is worse when the opponent's criticism is meant only to discredit, tendential arguments are spread along with invented data. For example, the magazine "KHLIBOROB UKRAYINY" (No. 4, 1980), claims that research conducted by the institute using sweep tillage under grain crops has shown that the amount of weeds in three years almost doubled, and in five years it increased eight times.

One wonders why institute scientists obtained such strange amounts of weeds on their areas of sweep tillage. The answer is simple: They transferred to the Ukrainian field a strictly virgin soil agrotechnology and using their own calculations are reaching completely incorrect conclusions.

The resistance of some scientists to an objective expansion of the new soil tilling system can be explained, in our opinion, by these basic reasons:

The absence of their own understandable research on the effectiveness of sweep tillage and the burden of statements favoring plowing.

Stereotyped research testing of the standard variant of sweep tillage, prepared and effective in conditions prevalent in Northern Kazakhstan, without creative revision for the soil-climatic conditions in the Ukraine. For example, in most of the experiments conducted by scientific-research institutions in the republic the stubble seeder SZS-2.1 was used for sowing. It was excellent for use on virgin soil, but is of little use for winter and spring grain crops in most of the better moisturized rayons of our republic because it lowers the yield through the large width of interrows.

The prejudice of some scientists against sweep tillage has caused an artificial decrease in requests for sweep machinery, the lack of well thought-out experiments in improving sweep soil tillage in many agricultural institutes and research stations, a neglect of the problems of soil protection in sweep tillage in study programs in colleges, technical schools, vocational training schools, and departments for raising the qualifications of leading agricultural personnel.

The attitude of these scientists is felt also in agricultural ministries and departments which do not yet have a fair evaluation of sweep type equipment and do not plan on increasing their production claiming that there are not enough requests. This does not consider the fact that there are few requests because the agronomists in most kolkhozes and sovkhozes in practice know very little about sweep tillage technology, and it is difficult to judge without seeing.

I believe it would be useful to formulate the theoretical conditions for the soil-protecting sweep system of agriculture.

1. Utilization of sweep tillage has a positive effect on soil processes and conditions. Humus decomposition lessens in the soil; humus is the cement for soil structure, a storage place for nutrients and an indication of the level of field fertility.
2. Sweep tillage technologies for raising crops allow for additional 15-25 mm of productive moisture in the meter layer of soil, and this occurs during sowing. It is especially important for obtaining even sprouts.
3. The system of sweep machinery and equipment allows for more effective weed control. In research experiments and in the experience of the Poltava area people, weed crop infestation in sweep tillage was 1.5 - 2 times lower than during regular plowing.
4. Finally, new equipment permits better tillage, it is cheaper, and crops can be sown within optimal agrotechnological dates.

The new system is vitally needed. This was proven by Academician V. N. Remeslo's deep conviction in the advantages of sweep tillage, fundamental scientific research by prof. N. K. Shykura in the Ukrainian Agricultural Academy, scientists I. Ye. Shcherbak at the Novoodes'ka Strain Testing Station, Nikolayevskaya Oblast, N. M. Martynovych at the Verkhnyats'ka Research Selection Station, scientists at the Poltava

Agricultural Institute, the local agricultural research station and other scientific-research institutions, and also wide production experience of farmers in Zaporozh'e and Nikolayev area in the Steppe, Foltava and Cherkassy area in the Forest-Steppe Zone.

This new agricultural system is moving onto the fields of kolkhozes and sovkhozes. It is widely needed not only in the Ukraine but also for other rayons of the European USSR, particularly for the chernozem zone. The faster and wider application it receives, the more important will the gross grain, feed and other crop harvests become.

It should be noted, however, that problems of sweep tillage do not as yet receive the needed attention. Too few scientific institutions are involved with it. Unfortunately, there is almost no concern for sweep tillage by "agrokhimsluzhba" [Agricultural Chemical Service], economists, specialists in plant protection, microbiologists and soil experts.

The new agricultural system is a complex problem, therefore, it must be solved in a complex manner. The future is in its favor.

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